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TRANSMITTAL OF APPEAL BRIEF (Small Entity)

Docket No.
0133-1

Application Of: Joseph Skiba

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/625,715	July 22, 2003	Rodney M. Lindsey	000025901	3765	8129

Invention:

LIGHTWEIGHT IMPACT RESISTANT HELMET SYSTEM

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:

October 20, 2004

☒ Applicant claims small entity status. See 37 CFR 1.27

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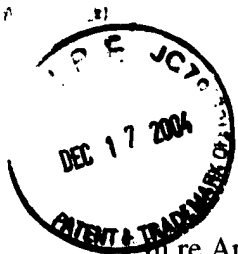


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Attorney Docket No.: 0133-1

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Joseph Skiba
Serial No.: 10/625,715
Filed: July 22, 2003
For: **LIGHTWEIGHT IMPACT RESISTANT HELMET SYSTEM**
Docket No.: 0133-1

Group Art Unit: 3765
Examiner: Rodney M. Lindsey

December 13, 2004
Bedminster, NJ 07921

Board of Patent Appeals and Interferences
United States Patent and Trademark Office
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

This Brief is in furtherance of the Notice of Appeal filed October 20, 2004 in the above-identified application.

Fees required under 37 C.F.R. § 1.17(f) are set forth in the accompanying Transmittal of Appeal Brief.

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(I) Real Party in Interest

The real party in interest is Joseph Skiba, the inventor of the subject matter of the instant application.

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(II) Related Appeals and Interferences

There are no other appeals or interferences known to the applicant or to the appellant's legal representative, which will directly affect or be directly affected by, or have a bearing on, the Board's decision in the pending appeal.

(III) Status of Claims

The claims on appeal are claims 1, 3, 5 – 9, and 11 – 12. A copy of claims 1, 3, 5 – 9, and 11 – 12, as amended, is set forth in Section IX.

Claims 2, 4, and 10 have been cancelled.

Claims 1, 5, 6, 8, 9, 11 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Document No. Hei 6-173110(A) to Suzuki et al. in view of US Patent 6,499,147 to Schiebl et al.

Claims 3 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. in view of Schiebl et al. and further in view of US Patent 6,434,755 to Halstead et al.

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(IV) Status of Amendments

By way of the Advisory Action mailed October 14, 2004, the Examiner has indicated that the amendment under 37 CFR 1.116 submitted on September 24, 2004 would be entered for purposes of appeal. Accordingly, the claim listing set forth in Appendix I reflects the amendments proposed by the amendment of September 24, 2004.

(V) Summary of Claimed Subject Matter

Applicant's invention, as delineated by present claims 1, 3, 5 – 9, 11, and 12, provides a helmet system that is strong, lightweight, and durable, yet provides increased protection to users engaged in contact sports. Many such activities, like football, entail body contact with large, impulsive forces experienced by both players. Improved protective equipment is urgently needed to protect the athletes, who have in recent years become bigger, stronger, and faster, only increasing the ferocity of their contact and the likelihood for serious, debilitating, or even life-threatening, injury. A given player may well experience several dozen significant contact events during even a single game, and several hundred such events over a year's season. Protective equipment items such as helmets experience repeated contact with the ground, as well as player-to-player contact. The equipment is also exposed to the elements during outdoor play. These factors make durability, both for aesthetic reasons and the need to maintain the required protective character, an essential feature of an ideal sports helmet.

Independent claim 1 delineates a helmet system comprising a helmet shell, a pliable, padded inner helmet, and an attachment means disposed within the helmet shell. See page 22, line 22, to page 23, line 14. An embodiment of the helmet system is depicted generally at 10 in Fig. 1A, as amended by way of applicant's amendment dated June 28, 2004. The molded shell of the helmet is shown at 11. A mesh or net 12 of reinforcing high strength fibers, composed of Kevlar® or Spectra®, is disposed on each of the inner and outer surfaces of the shell. The thickness of the helmet shell 11 is typically smaller than a conventional helmet, due to the strengthening properties afforded by reinforcing fibers placed and bonded permanently on the helmet's exterior and interior surfaces. Within the reinforced helmet 11 there is provided a

second inner pliable padded helmet 13, which is in close contact with the wearer's head and the inner surface of the helmet shell 11. During impact, the helmet shell 11 undergoes bending deformation, with a moderate to low curvature, causing shell 11 to contact a relatively large area of the inner pliable padded helmet 13. Loads resulting from impacts against the exterior of shell 11 are distributed, reducing stresses and providing increased shock absorption. In addition, the lighter weight of the fiber reinforced helmet shell 11 limits the amount of applied force delivered by the helmet wearer against other sports participants during blocking or tackling events. Fig. 1B provides a cross-sectional view showing in more detail the bonding of nets 12 to the inside and outside surfaces of shell 11, along with inner padded helmet 13. Strap 20 provides one suitable form of attachment means. See Fig. 1A and the paragraph beginning at page 22, line 22, both having been amended in applicant's response under 37 CFR 1.111, dated June 28, 2004. In particular, see lines 10-12 of the amended paragraph.

The helmet shell 11 is composed of a polymeric material selected from the group consisting of poly-alpha-olefins, homopolymers of ethylene, copolymers of ethylene and other alpha-olefins, polyamides, polycarbonate, polyvinyl chloride, cellulose acetobutyrate, polybutylene terephthalate, polyoxymethylene polymers, polyester, and epoxy. Page 18, lines 16-20, and page 21, lines 13-17. The bonded net or mesh 12 is composed of long-length para-aramid or high density polyethylene reinforcing fibers. See the paragraph beginning at page 16, line 16, as amended in applicant's response under 37 CFR 1.111, dated June 28, 2004. Inner helmet 13 is composed of shock absorbing material, such as polymeric foam. Page 16, lines 2-4.

Independent claim 9 recites, in product-by-process form, an improved helmet system. The helmet comprises a polymeric material molded into a molding cavity. Page 16, lines 21-24.

The improved helmet employs a polymeric material selected from the group consisting of poly-alpha-olefins, homopolymers of ethylene, copolymers of ethylene and other alpha-olefins, polyamides, polycarbonate, polyvinyl chloride, cellulose acetobutyrate, polybutylene terephthalate, polyoxymethylene polymers, polyester, and epoxy. Page 18, lines 16-20. In addition, the improved helmet is molded with a mesh or net of long-length fibers disposed on both faces of the molding cavity. The mesh or net is composed of long-length fibers of para-aramid or high density polyethylene reinforcing fibers. See the paragraph beginning at page 16, line 16, as amended by applicant's response under 37 CFR 1.111, dated June 28, 2004.

Claim 5, dependent from claim 1, delineates a helmet system wherein a preferred mesh or net has a length greater than 1 inch. Page 16, line 19.

Claims 6, 8, and 11, all dependent from claim 1, set forth additional features of preferred embodiments of the present helmet system. Claim 6 calls for the pliable, padded inner helmet to be composed of energy absorbing polymeric foam. Page 19, lines 10-12. Claim 8 recites an attachment means comprising a strap, such as strap 20 depicted in amended Fig. 1A. See also the paragraph beginning at page 22, line 22, as amended in applicant's response under 37 CFR 1.111, dated June 28, 2004. Claim 11 recites polycarbonate as a preferred polymeric material for the helmet shell. Page 16, line 17.

Claim 12, dependent from claim 1, calls for the mesh or net to be aligned in the direction of tension and compression imposed on the surfaces of the helmet during impact. As set forth at page 19, lines 2-7, reinforcement thus disposed supports compressive and tensile stresses caused by impact against the helmet shell. In the event of impact, the inner surface is stressed in tension and the outer surface is stressed in compression. The fiber alignment thereby permits the helmet

to resist these forces, reducing the degree of bending deformation at the impact site. As a result, the impact resistance of the helmet to flexure and cracking is improved. The helmet thus exhibits higher overall strength, creating a reduced curvature-bending region where an impact load is applied.

Claims 3 and 7, both dependent from claim 1, recite preferred dimensions for the present helmet system. Claim 3 requires a helmet shell thickness ranging from about 1/16 to ¼ inch. Page 16, line 6. Claim 7 delineates a preferred thickness ranging from about 0.5 to 1 inch for the inner helmet. Page 16, lines 4-5.

(VI) Grounds of Rejection To Be Reviewed on Appeal

(A) Whether claims 1, 5, 6, 8, 9, 11 and 12 should be rejected as unpatentable under 35 U.S.C. §103(a) over Suzuki et al. in view of Schiebl et al.; and

(B) Whether claims 3 and 7 should be rejected as unpatentable under 35 U.S.C. §103(a) over Suzuki et al. in view of Schiebl et al. and further in view of US Patent 6,434,755 to Halstead et al.

(VII) Arguments

A. The helmet system for a player engaged in contact sports of claim 1 (and claims 5, 6, 8, 11, and 12 dependent thereon) and the improved helmet system of claim 9 meet the conditions for patentability.

The Examiner has rejected claims 1, 5, 6, 8, 9, 11 and 12 under 35 USC §103(a) on the following basis:

Claims 1, 5, 6, 8, 9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent to Suzuki et al. in view of Schiebl et al. Note paragraph [0017] of the translation of Suzuki et al. and the helmet shell defined by “organic fiber” with inner and outer surfaces reinforced with a bonded net or mesh of long length fibers (unidirectional fiber sheets) detailed in paragraphs [0012] and [0013]. Suzuki et al. teaches that it is old and well known to form the shell of polycarbonate (see paragraph [0002]) and to provide a shock absorbing inner helmet 2,3 and attachment means 4 in the helmet system (see paragraph [0002]). It would have been obvious to one of ordinary skill in the art at the time of the invention to form the shell of polycarbonate and to provide the system with an inner helmet and attachment means as claimed in view of such prior art teaching of Suzuki et al. to achieve the advantage of defining a racing sport helmet.

Suzuki et al. discloses a helmet body structure having unidirectional fiber arranged approximately parallel to edge portions of the body. Schiebl et al. discloses protective headgear, which may comprise a shell made of an inner and outer material layered over an internal foam core to effect both strength and light weight.

1. Independent claims 1 and 9 meet the conditions for patentability because the combination of Suzuki et al. and Schiebl et al. does not teach or suggest the helmet system of claim 1 or the improved helmet system of claim 9.

With respect to claims 1 and 9, the following statement has been made:

Suzuki et al. do not teach forming the net or mesh of para-aramid fibers as claimed. Schiebl et al. teach old the use of such fibers (KEVLAR), see column 3, lines 21-40. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Suzuki et al. such that the net or mesh or unidirectional fiber sheet is formed of KEVLAR in the manner of Schiebl et al. to achieve the advantage of lightweight and strength.

Applicant respectfully traverses the Examiner's contention that the helmet system delineated by present claim 1 and the improved helmet system recited by present claim 9 is obvious over the combination of Suzuki et al. and Schiebl et al.

In particular, applicant's claims 1 and 9 call for a mesh or net of long length fibers present on the inside and outside surfaces of the claimed helmet system (claim 1); and the faces of the helmet molding cavity wherein the improved helmet system of claim 9 is formed. Those fibers are composed of long-length para-aramid (e.g., KEVLAR®) or high density polyethylene (e.g., SPECTRA®) fibers. On the other hand, paragraph [0017] of Suzuki et al., to which the Examiner has pointed, calls for reinforcement by glass mat and unidirectional fiber sheets. The unidirectional fiber sheets are said to comprise "long inorganic fibers in groups of 50 to 4,000 glass fibers" (paragraph [0013], line 2, emphasis added). Although admitting that Suzuki et al. fails to disclose a mesh or net that includes KEVLAR (or of SPECTRA) fibers, the Examiner has contended that it would be obvious to modify the unidirectional fiber sheets disclosed by Suzuki et al., wherein glass fibers are said to be continuously bundled with organic fiber (paragraph [0013], lines 2-4, emphasis added) to employ KEVLAR. Such a reconstruction is said to be in

the manner of Schiebl et al., as disclosed at col. 3, lines 21-40, and obvious to achieve the advantage of light weight and strength.

Applicant disagrees with the Examiner's characterization of the cited passage of Schiebl et al. There clearly is no disclosure or suggestion in the cited passage that organic fibers be used in a bonded mesh or net, as required by present claims 1 and 9. Instead, the fibers of Schiebl et al., which may be either organic (e.g. Kevlar) or inorganic (e.g. Fiberglas) (col. 3, lines 38-39), are part of a composite that is impregnated with a resin such as an epoxy.

Applicant respectfully contends that the juxtaposition of organic and inorganic fibers in the Scheibl et al. disclosure does not provide a basis for the required reconstruction wherein the Suzuki et al. sheets, which contain both inorganic and organic fibers, are formed with the para-aramid or high density polyethylene organic fibers recited by claims 1 and 9. The Examiner alleges that one would be so motivated by weight and strength considerations, but has not pointed to any teaching in the prior art to support this alleged motivation. Apart from applicant's own disclosure, the Examiner has not given any citation suggesting that such properties would necessarily result, whether in either the Suzuki et al. or Schiebl et al. references applied or in other prior art. Although Schiebl et al. discloses a helmet having a rigid shell of relatively light weight, such characteristic is said to result from the bonding of inner and outer layers to a rigid foam core. Col. 3, lines 25-27. No indication whatsoever is provided by Schiebl et al. that relates light weight to the presence of long-fiber reinforcement. Of further significance is the lack of recognition by Suzuki et al. of KEVLAR as a material suitable for a reinforcing mesh. Despite the commercial availability of KEVLAR since the 1970's, long before the filing date of Suzuki et al., and despite the recognition in Suzuki et al. that KEVLAR fibers are sometimes

blended in helmet bodies (see, e.g., paragraph [0003], line 5), Suzuki et al. do not disclose or suggest the use of KEVLAR or any other organic reinforcing fiber for surface reinforcement. Instead, Suzuki et al. teach use of glass fiber, which is clearly an inorganic material.

Applicant thus submits that the proposed combination of Suzuki et al. and Schiebl et al. is improper, because it both fails to suggest the totality of the claimed subject matter and would require substantial reconstruction and redesign of the prior art based on applicant's own disclosure as a template. Such required reconstruction and redesign has been clearly held to preclude a finding of obviousness. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Even if, *arguendo*, the Suzuki et al. and Schiebl et al. references contained all the elements of present claims 1 and 9, applicant/appellant respectfully submits that merely locating these elements variously in the references of a proposed combination is insufficient to render the claims unpatentable under 35 USC §103(a), absent a proper motivation to combine.

As the Federal Circuit has ruled, "[P]rior art references before the tribunal must be read as a whole and consideration must be given where the references diverge and teach away from the claimed invention. . . . Moreover, appellants cannot pick and choose among individual parts of assorted prior art references 'as a mosaic to recreate a facsimile of the claimed invention.' "

Akzo N.V. v. United States Int'l Trade Comm'n, 1 USPQ 2d 1241, 1246 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). The Federal Circuit ruled similarly in *In re Fritch*, 972 F. 2d 1260, 23 USPQ 2d 1780, 1783-84 (Fed. Cir. 1992):

"The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification...

“It is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that ‘[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.’” (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ 2d 1596, 1600 (Fed. Cir. 1988)).

The Federal Circuit has reiterated the impermissibility of hindsight reconstruction in *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ 2d 1453, 1457 (Fed. Cir. 1998):

“. . . ‘virtually all [inventions] are combinations of old elements.’ *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983); *see also Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 USPQ 8, 12 (Fed. Cir. 1983) (‘Most, if not all, inventions are combinations and mostly of old elements.’). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be ‘an illogical and inappropriate process by which to determine patentability.’” *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 USPQ 2d 1551, 1554 (Fed. Cir. 1996).

Applicant respectfully submits that the Examiner is engaging in the very hindsight reconstruction forbidden by the *Akzo*, *Fritch*, and *Rouffet* courts by failing to identify the required motivation for the reconstruction made and by excluding the foam core aspect that the later-filed Schiebl et al. reference considers “important” to achieving the required properties, as set forth hereinbelow in greater detail.

Furthermore, and in the alternative, applicant maintains that the proposed combination of Schiebl et al. with Suzuki et al. is improper, because Schiebl et al. expressly teaches away from any helmet having the polymeric helmet shell required by present claims 1 and 9.

In particular, Fig. 1 of Schiebl et al. depicts a helmet which has an inner layer 12 and an outer layer 14 permanently bonded to an inner rigid foam core 16 to form a rigid shell of relatively light weight.” Col. 3, lines 25-27, emphasis added. Schiebl et al. specifically denotes element 16 as being an “inner rigid foam core” at col. 3, line 27, within the passage cited by the Examiner. Schiebl et al. goes on to teach away from any helmet lacking an inner foam core. [“The core which is preferably made of polyethylene foam is important to the performance requirements. Although it may be possible to produce a shell of either a single composite layer, or multiple composite layers, without the light weight foam core spacing the inner and outer layers, the deflection properties of these shells would not match those of the laminated core shell when weight of the shell is considered.” See col. 3, lines 43-50, of Schiebl et al., emphases added.]

That is to say, Schiebl et al. teaches use of an inner foam core to increase rigidity of the helmet shell. By this means Schiebl et al. attempts to avoid damage, such as cracking, to the helmet shell caused by high impact loading. In contrast to the Schiebl et al. teaching, Suzuki et al. discloses a helmet body structure clearly lacking any inner foam core. Instead, the helmet body is impregnated with liquid resin after formation in a mold, so that a solid, and not a foam structure, is formed. Paragraph [0017].

The Federal Circuit has ruled it improper to combine references in an obviousness rejection when one reference teaches away from combination with another reference. *In re Rudko*, 194 F.3d. 1336, 1999 WL 319508 (Fed. Cir. 1999, unpublished). Applicant respectfully submits that this holding renders improper the proposed combination in the instant matter.

The Examiner has further rejected claim 9 as follows:

“...product-by-process claim 9 even though reciting features in terms of how they are made, e.g. injection molding and molding, is still a product claim, and it is the patentability of the product, not the process steps, which must be determined. Suzuki et al. teach the shell of “organic fiber” regardless of how it is formed and teach the mesh or net of the helmet system regardless of how formed with the shell. It would have been obvious to one of ordinary skill in the art at the time of the invention to form the shell of polycarbonate an ‘organic fiber’ in view of such prior art teaching of Suzuki et al. (see paragraph [0002]) to achieve the expedience of using a readily available helmet material known for withstanding an impact thereto.”

Applicant agrees that the patentability of claim 9, albeit written in product-by-process terminology, is properly determined by the product itself. However, it is submitted that the foregoing rejection falls altogether short of the requirement that every feature of the claimed subject matter be disclosed or suggested by the art applied. In particular, the cited paragraph [0002] of Suzuki et al. admittedly discloses a prior art helmet that includes a body that may be made of a polycarbonate resin. But claim 9, as amended, recites an improved helmet wherein: (a) the polymeric material of the helmet shell is selected from a particular group of polymeric materials; and (b) a mesh or net of long-length, para-aramid or high density polyethylene fibers is disposed on both faces of the helmet molding cavity and bonded with the polymeric material during the helmet molding operation. Paragraph [0002] is completely silent as to the latter feature. As set forth hereinabove, applicant maintains that the particular mesh or net required by claim 9 is not disclosed or suggested by the art applied. Even less is there any suggestion that such net or mesh be bonded with the polymeric material, as delineated by claim 9. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established, even in view of the combination of references applied.

Accordingly, it is respectfully submitted that the helmet system called for by present claims 1 and 9 is not rendered obvious by the combination of Suzuki et al. and Schiebl et al.

2. Claim 5 (dependent from claim 1) meets the conditions for patentability because neither Suzuki et al. nor Schiebl et al., whether alone or in combination, discloses or suggests the helmet system of claim 5.

Claim 5 was further rejected by the Examiner under 35 USC 103(a) as follows:

Suzuki et al. discloses a length of 5 cm for the prior art. It would have been obvious to maintain the a length of at least 5 cm in the invention of Suzuki et al. since one of ordinary skill in the art at the time of the invention would readily have recognized the goal of Suzuki et al. of employing long length fibers greater than that of the prior art.

As set forth hereinabove in connection with the rejection of claims 1 and 9 under 35 USC 103(a), applicant respectfully maintains that the art applied fails to render obvious claim 1, on which claim 5 depends. It is further submitted that the proposed motivation for modifying the teaching of Suzuki et al. is not properly substantiated. More specifically, applicant is unable to locate in Suzuki et al. the purported indication of a goal of employing fibers longer than those used in the prior art. No citation has been provided. It is said by Suzuki et al. that "The glass mats thus employed have the same specifications as the glass mats that have been conventionally employed as the base material of the laminate body constituting the helmet; that is, they consist of straight glass fibers of fixed length (about 5 cm)..." Paragraph [0004], lines 4-8. However, applicant is unable to locate in the Suzuki et al. reference any disclosure or suggestion that longer fibers be used, on which the proposed motivation to modify Suzuki et al. to provide longer fibers is based.

The Federal Circuit has repeatedly emphasized the requirement for specific motivation to combine references. For example, the Court has recently stated:

“The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight invalidation of patent claims, the law requires some ‘teaching, suggestion or reason’ to combine cited references. When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine references need to be applied rigorously.” *McGinley v. Franklin Sports Inc.*, 262 F.3d 1339, 60 USPQ 2d 1001, 1008 (Fed. Cir. 2001), emphasis added, citing *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579, 42 USPQ 2d 1378, 1383 (Fed. Cir. 1997).

Moreover, the Federal Circuit has further indicated that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to modify the references in the manner proposed. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ 2d 1453, 1457-58 (Fed. Cir. 1998). In the present instance with respect to claim 5, it is respectfully submitted that by pointing, without specific reference, to a motivation in Suzuki et al. that is not found, whether expressly or implicitly, the Examiner has not satisfied any of these bases to establish the proposed combination. Accordingly, it is submitted that combination inherently engages in impermissible hindsight reconstruction.

3. Claims 6, 8, and 11 (all dependent from claim 1) meet the conditions for patentability because neither Suzuki et al. nor Schiebl et al., either alone or in combination, discloses or suggests the helmet system of claims 6, 8, and 11.

Claim 6 was further rejected by the Examiner as follows:

With respect to claim 6 note the teaching of the use of Styrofoam by Suzuki et al. (see paragraph [0002]).

Claim 8 was further rejected by the Examiner as follows:

With respect to claim 8 note the strap 4 as taught by Suzuki et al.

Claim 11 was further rejected by the Examiner as follows:

With respect to claim 11 note the teaching of the use of polycarbonate in Suzuki et al. (see paragraph[0002]).

As set forth hereinabove in connection with the rejection of claims 1 and 9 under 35 USC 103(a), applicant respectfully maintains that the art applied fails to render obvious claim 1, on which claims 6, 8, and 11 depend. Accordingly, claims 6, 8, and 11, which further restrict claim 1, are submitted to be patentable over the combination of Suzuki et al. and Schiebl et al., as applied by the Examiner, for at least the same reasons as claim 1.

4. Claim 12 (dependent from claim 1) meets the conditions for patentability because neither Suzuki et al. nor Schiebl et al., whether alone or in combination, discloses or suggests the helmet system of claim 12.

Claim 12 was further rejected by the Examiner under 35 USC 103(a) as follows:

With respect to claim 12 note such teaching in paragraph [0009] of the translation.

As set forth hereinabove in connection with the rejection of claims 1 and 9 under 35 USC 103(a), applicant respectfully maintains that the art applied fails to render obvious claim 1, on which claim 12 depends.

Applicant further submits that the provision of a mesh or net of fibers on both the inside and outside surfaces, as required by feature (a) of claim 1, in conjunction with the required alignment of the fibers additionally delineated by claim 12, goes well beyond any disclosure or suggestion in Suzuki et al., in particular at paragraph [0009]. Significantly, the paragraph [0009] disclosure is confined to tensile stress, there being no mention or recognition of compressional

forces whatsoever. By way of contrast, claim 12 calls for an alignment in the direction of both tension and compression imposed on both surfaces of the claimed helmet during impact. The mechanics of deformation result in the presence of both tensile and compressional stresses on the respective surfaces of a helmet undergoing impulsive deformation. The provision of reinforcing mesh or net, as required by claim 1, and with the alignment further delineated by claim 12, beneficially improves the resistance of the present helmet to degradation or failure during such a deformation event. See, e.g., page 19, lines 2-7. Such highly advantageous behavior is neither disclosed nor suggested by Suzuki et al. or Schiebl et al., whether alone or in combination, even in view of the disclosure at paragraph [0009] of Suzuki et al. Accordingly, applicant respectfully maintains that claim 12 patentably defines over Suzuki et al. and Schiebl et al.

5. Conclusion.

In view of the foregoing remarks, it is submitted that present claims 1, 5-9, 11, and 12 patentably define over the combination of Suzuki et al. and Schiebl et al. Accordingly, reversal of the rejection of claims 1, 5-9, 11, and 12 under 35 USC 103(a) over Suzuki et al. and Schiebl et al. is respectfully requested.

B. The helmet system for a player engaged in contact sports of claims 3 and 7 meets the conditions for patentability.

The Examiner has rejected claims 3 and 7 under 35 USC §103(a) on the following basis:

Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. in view of Schiebl et al. as applied to claim 1 above, and further in view of Halstead et al.

Halstead et al. provides a helmet including a substantially rigid shell having a shell thickness defined by a substantially continuous exterior surface spaced apart from a substantially continuous interior surface.

1. Claims 3 and 7 (both dependent from claim 1) meet the conditions for patentability because neither Suzuki et al., Schiebl et al., nor Halstead et al., whether alone or in any combination thereof, discloses or suggests the helmet system of claims 3 and 7.

With respect to Claims 3 and 7, the Examiner has made the following statement:

Suzuki et al. do not teach either the helmet shell thickness or inner helmet thickness as claimed. Halstead et al. teach old a shell thickness in the range of 1/16 to 1/4 inch (see column 1, line 67) and an inner helmet thickness in the range of 0.5 to 1 inch (see column 4, lines 8-24). It would have been obvious to provide the shell and inner helmet of Suzuki et al. with the respective thickness of the shell and inner helmet of Halstead et al. since one of ordinary skill in the art at the time of the invention would readily have recognized such thickness as adequate starting points for producing a functional helmet system.

As set forth hereinabove in connection with the rejection of claims 1 and 9 under 35 USC 103(a), applicant respectfully maintains that the art applied fails to render obvious the subject matter of claim 1, on which claims 3 and 7 depend. Halstead et al. likewise fails to disclose or suggest any helmet having the fiber mesh or net reinforcement delineated by claim 1. As a result, any helmet constructed in accordance with the combined teachings of Suzuki et al., Schiebl et al., and Halstead et al. still lacks the beneficial increase in strength, durability, and

improved protection of the wearer attained by applicant's helmet without a concomitant increase in weight.

Applicant further submits, however, that the thicknesses of the helmet shell and inner helmet disclosed as suitable for the Halstead et al. need not be appropriate for the markedly different helmet construction disclosed by applicant. Significantly, the Examiner has regarded the thickness ranges provided by Halstead et al. as being "adequate starting points," but has not pointed to evidence that one of ordinary skill in the present art would recognize such thicknesses as providing an expectation of success in constructing a helmet having the beneficial attributes of applicant's helmet. The courts have recognized that "obvious to try" is not the standard of obviousness mandated by 35 USC 103(a). *Ecolochem, Inc. v. Southern Cal. Edison Co.*, 56 USPQ 2d 1065, 1075 (Fed. Cir. 2000). Applicant accordingly submits that the Examiner's contention that the thickness ranges of Halstead et al., which were said to be "adequate starting points," do not rise to the standard of obviousness for one of ordinary skill in the relevant art.

2. Conclusion.

In view of the foregoing remarks, it is submitted that present claims 3 and 7 patentably define over the combination of Suzuki et al., Schiebl et al., and Halstead et al. Accordingly, reversal of the rejection of claims 3 and 7 under 35 USC 103(a) over Suzuki et al., Schiebl et al., and Halstead et al. is respectfully requested.

(VIII) Conclusion

In light of the foregoing remarks, it is respectfully submitted that the helmet system for a player engaged in contact sports of claim 1 and the improved helmet system of claim 9 are not disclosed or suggested by any combination of the art references applied, and thus meet the conditions for patentability required by 35 USC §103(a). It is further submitted that claims 3, 5-8, 11, and 12, dependent from base claim 1, are patentable within the meaning of 35 USC §103(a) for at least the same reasons as the base claim.

Accordingly, reversal of the rejection of claims 1, 3, 5-9, 11, and 12 under 35 USC §103(a), and allowance of the present application, are earnestly solicited.

Respectfully submitted,

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(IX) Claims Appendix — Claims On Appeal

1. (currently amended) A helmet system for a player engaged in contact sports, comprising:
 - a. a helmet shell having inner and outer surfaces reinforced with a bonded net or mesh of long length fibers comprising long-length para-aramid or high density polyethylene reinforcing fibers, said helmet shell being composed of a polymeric material selected from the group consisting of poly-alpha-olefins, homopolymers of ethylene, copolymers of ethylene and other alpha-olefins, polyamides, polycarbonate, polyvinyl chloride, cellulose acetobutyrate, polybutylene terephthalate, polyoxymethylene polymers, polyester, and epoxy;
 - b. a pliable, padded inner helmet attached to said inner surface of said helmet shell, said inner helmet being composed of shock absorbing material; and
 - c. an attachment means disposed within said helmet shell for positioning and holding said second pliable padded inner helmet in contact with the player's head, said helmet shell producing a low curvature bend under impact load, increasing contact area between said inner surface and said inner helmet to thereby increase load absorption and decrease load intensity at the player's head.
2. (cancelled)
3. (original) A helmet system as recited by claim 1, wherein said helmet shell has a thickness ranging from about 1/16 to 1/4 inch.
4. (cancelled)

5. (original) A helmet system as recited by claim 1, wherein said net or mesh has a length greater than 1 inch.
6. (original) A helmet system as recited by claim 1, wherein said inner helmet is composed of energy absorbing polymeric foam.
7. (original) A helmet system as recited by claim 1, wherein said inner helmet has a thickness ranging from about 0.5 to 1 inch.
8. (original) A helmet system as recited by claim 1, wherein said attachment means comprises a strap.
9. (currently amended) In a helmet system having a helmet shell fabricated by injection molding a polymeric material into a molding cavity, the improvement wherein said polymeric material is at least one material selected from the group consisting of poly-alpha-olefins, homopolymers of ethylene, copolymers of ethylene and other alpha-olefins, polyamides, polycarbonate, polyvinyl chloride, cellulose acetobutyrate, polybutylene terephthalate, polyoxymethylene polymers, polyester, and epoxy; and a mesh or net of long length fibers comprising long-length para-aramid or is disposed on both faces of the helmet molding cavity and integrally bonded with said polymeric material during molding to form a composite helmet shell.
10. (cancelled)
11. (previously presented) A helmet system as recited by claim 1, wherein said polymeric material is polycarbonate.

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12. (previously presented) A helmet system as recited by claim 1, wherein a full length of said fibers is said mesh or net is aligned in the direction of tension and compression imposed on said surfaces of said helmet during impact.

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(X) Evidence Appendix

Not applicable.

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(XI) Related Proceedings Appendix

Not applicable.